

A new global mascon solution tuned for high-latitude ice studies

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A new global mascon solution has been developed with 1-arc-degree spatial and 10-day temporal sampling. The global mascons are estimated from the reduction of nearly 8 years of GRACE K-band range-rate data. Temporal and anisotropic spatial constraints have been applied for land, ocean and ice regions. The solution construction and tuning is focused towards the Greenland and Antarctic ice sheets (GIS and AIS) as well as the Gulf of Alaska mountain glaciers (GoA). Details of the solution development will be discussed, including the mascon parameter definitions, constraints, and the tuning of the constraint damping factor. Results will be presented, exploring the spatial and temporal variability of the ice sheets and GoA regions. A detailed error analysis will be discussed, including solution dependence on iteration, damping factor, forward modeling, and multi-technique comparisons. We also investigate the fundamental resolution of the solution and the spatial correlation of ice sheet inter-annual change. Finally, we discuss future improvements, including specific constraint application for the rest of the major land ice regions and improvements in solution regularization.